REMARKS

Claims 1 and 2-15 are now present in this application. Claims 1 and 8 are independent claims. Claim 3 has been cancelled and claims 1, 4, 5 and 8 have been amended by this Reply. Claims 14 and 15 are new.

REJECTIONS UNDER 35 U.S.C. § 102

Claims 1-13 have been rejected under 35 U.S.C. § 102 (a) as being unpatentable over Cheek et al. (U.S. Pat. No. 6,372,587 B1). Applicants respectfully traverse this rejection.

Cheek et al. disclose a semiconductor processing technique for using a halo implant process to form an asymmetrical halo implant. As shown in Figs. 5 and 6, an asymmetrical halo implant 535 is formed adjacent the left side of gate structure 300. Additionally, a halo implant is also formed adjacent the mask 510. As discussed in col. 6, lines 10-18, the halo implants are formed by a halo dopant of an angle between 25-65 degrees with respect to substrate surface. A second halo dopant process may also be performed after rotating the substrate by 180 degrees. However, the mask 510 prevents the formation of a symmetrical halo implant around the gate structure 300. See col. 6, lines 44-45. Cheek et al. further disclose the option of a third implant 1200 shown in Fig. 12 as being perpindicular to the substrate and able to be performed before or after the halo dopant processes of Figs. 5 and 6.

Cheek et al. discuss that symmetrical halo implants could be formed using the implant processes of Figs. 5 and 6 when the mask 510 is not present. However, Cheek et al, do not disclose that the third implant would still be performed if symmetrical implants were formed using the dopant processes of Figs. 5 and 6.

Since Cheek et al. is directed towards processing techniques for forming asymmetrical halo implants around gate structures, Cheek et al. do not disclose, "forming symmetrical first and second implants by performing a first halo implant process and a second halo implant process on the first region . . . and performing a third halo implant process on the first region of the semiconductor substrate by using a tilt angle of about 0°, " as recited by claim 1 as amended and similarly claim 8 as amended.

Accordingly, claims 1 and 8 are allowable over the prior art. Regarding dependent claims 2, 4-7 and 9-13, these claims are allowable for at least the same reasons as their corresponding independent claims.

New claims

Newly added claims 14 and 15 are supported in the Specification on at least page 10, lines 5-10. Further, claims 14 and 15 are allowable at least because of the reasons discussed with respect to claims 1 and 8, and further, because Cheek et al. do not disclose, "the first and second halo implants are homogenously doped," as recited in claims 14 and 15.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Jayne E. Saydah, Registration No.48,796, at (703) 205-8000, in the Washington, D.C. area. Prompt and favorable consideration of this Amendment is respectfully requested.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit

Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

Please replace the title with the following:

--METHOD OF FORMING A JUNCTION IN SEMICONDUCTOR DEVICE USING HALO IMPLANT PROCESSING--

IN THE CLAIMS:

The claims have been amended as follows:

Claim 1. (Amended)

1. A method for forming a junction in a semiconductor device with symmetrical halo implants, comprising the steps of:

forming a photoresist film pattern on a semiconductor substrate excluding a first region;

forming symmetrical first and second implants by performing a first halo implant process and a second halo implant process on the first region of the semiconductor substrate by using a tilt angle of about 45° and twist angles of 0° and 180° corresponding to the first halo implant and second halo implant, respectively; and

performing a [second] third halo implant process on the first region of the semiconductor substrate by using a tilt angle of about 0°.

Claim 4. (Amended)

The method according to claim 1, wherein the [second] third halo implant process is performed only once at a tilt angle of about 0°.

Claim 5. (Amended)

The method according to claim 1, wherein the [second] third halo implant process is performed with an energy of 16KeV and a dose of 4×10^{12}.

Claim 8. (Amended)

A method for forming a junction with symmetrical halo implants in a semiconductor device, comprising the steps of:

providing a semiconductor substrate divided into a first conductive type MOS region and a second conductive type MOS region;

forming a photoresist film pattern on the second conductive type MOS region;

forming symmetrical first and second halo implants by performing first and second halo implant processes on the first conductive type MOS region at about a 45° tilt angle and at twist angles of about 0° and 180°, respectively; and

performing a third halo implant process on the first conductive type MOS region, by using a tilt angle of about 0°.

Clams 14 and 15 were added.